

# **Sociodemographic determinants of download and use of a mHealth application for Corona contact tracing (Corona Warn App) in Germany – results of the COSMO study**

## **Abstract/Study description**

This study aims to analyze the association of sociodemographic characteristics of users to download and use of the Corona tracing app launched in Germany in June 2020 (“Corona Warn App”, CWA). Also, we want to examine attitudes towards the app stratified by selected population characteristics to understand barriers to successful use. Data from the most recent waves of the COVID-19 Snapshot Monitoring (COSMO) that contain items referring to the CWA (waves 15-19) will be used. Sociodemographic characteristics include age, gender, education, federal state, migrant status, number of children, presence of chronic disease, work status, income, smart phone use. Variables concerning CWA include information on download, use and opinions about functionality of the CWA. Main outcome parameter for CWA use will be the question “have you already downloaded the app”. Attitudes towards CWA will be analysed exploratively. Multiple logistic regression analyses will be used to assess the association of sets of potential sociodemographic predictors as independent variables.

## **Introduction**

Uncontrolled spread of corona virus SARS-CoV-2 is likely overwhelm health care systems. Consequently, in addition to the deaths caused by COVID-19 under optimal medical care, deaths will increasingly be due to the overflow of routine and intensive care capacities. Aim of current containment strategies is therefore to keep the incidence of new infections at a low level that facilitates epidemic control, until vaccination or effective treatment will become available. The infectious characteristics of SARS-CoV-2 indicate that a substantial percentage of transmissions occur in the presymptomatic or asymptomatic stage. Therefore, a containment strategy for COVID-19 has to focus on informing and isolating contact persons of cases before they become infectious. To be able to relax contact restrictions for the whole population, conventional contact tracing is ideally supplemented by appropriate and effective mHealth applications that have the potential to interrupt transmission chains by tracing and identifying presymptomatic infections. The German health authorities launched a Corona tracing app in June 2020 (“Corona Warn App”, CWA); this app had 15 Mio downloads within four weeks. For this app to be an acceptable part of the German containment strategy, several preconditions have to be fulfilled. The overall aim of contact tracing can be measured by the “ability of any contact-tracing system to reduce disease transmission” (Braithwaite et al. 2020). In principle efficacy of an app is defined by reach and timeliness of contacting potential contacts of cases, whereas effectiveness of the app is defined by number of cases avoided in real life. Effectiveness in real life on a national level however is further defined by additional parameters. The app needs to be accessible independently of socioeconomic status, education or age. Aim of this study is therefore to analyze the association of sociodemographic characteristics of users to CWA use and attitudes towards the app to understand barriers to successful use.

## **Materials and Methods**

### **Sampling Plan / Data collection / Data acquisition**

Data from the most recent waves of the COVID-19 Snapshot Monitoring (COSMO) that contain items referring to the CWA (waves15-19) will be used. COSMO consists of consecutive cross-sectional surveys of the general population in Germany. Surveys started in March 2020. Currently, 21 waves have been conducted. Institutional Review Board agreement has been obtained from University of Erfurt.

### **Sample size, participant characteristics**

Each wave with n = 1000 participants is a quota sample, matching the general population in Germany in terms of for age, gender, and residence in a Federal state of Germany (Nielsen areas).

### **Variables (manipulated variables; measured variables)**

Sociodemographic characteristics include age, gender, education, federal state, migrant status, number of children, presence of chronic disease, work status, income, smart phone use. Variables concerning CWA include information on download, use and opinions about functionality of the CWA.

### **Analysis Plan**

Descriptive and multiple adjusted analyses will be carried out. We will calculate means for continuous variables and percentages for categorical variables.

Main outcome parameter for CWA use will be the question “have you already downloaded the app (yes/no/does not work on my smartphone)”. This question has been included in several of the waves and will be analysed separately for each wave. Multiple logistic regression analyses will be used to assess the association of sets of potential predictors (sociodemographic characteristics, presence of chronic disease, work status, e.g. healthcare worker, wave) as independent variables on CWA use.

Attitudes towards CWA will be analysed stratified by age, gender and education. As this analysis will be explorative, no formal adjustment will be made for multiple testing. Significance will be set on a test-wise 5% level.

### **References**

Braithwaite I, Callender T, Bullock M, Aldridge RW. Automated and partly automated contact tracing: a systematic review to inform the control of COVID-19. *Lancet Digit Health*. 2020 Aug 19. doi: 10.1016/S2589-7500(20)30184-9. Epub ahead of print.